

# Federal Transit Planning and Research Program Workshop Report

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U.S. Department of Transportation  
Federal Transit Administration

**VOLUME ONE**  
**Summary**

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April 1992

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Office of Technical  
Assistance and Safety



# **SUMMARY**

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## ***Scope of this Report***

Participation of the transit community in the development and implementation of the Nation's Transit Planning and Research Program is vital. The Federal Transit Administration (FTA) recognizes this need, and has consulted with national interests in formulating the Department's legislative reauthorization proposal. The resultant Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) provides two major consultative initiatives, the Transit Cooperative Research Programs Independent Governing Board, and the Technology Development Federal Advisory Committee.

Because of the scope and importance of the Transit Planning and Research Program (TP&R), the FTA is actively communicating with its constituents in formulating a program that will lead us well into the twenty first century.

In 1990, FTA invited representatives of the Nation's transit systems, transportation planners, developers, suppliers, and operators to Kansas City, Missouri to develop a set of research priorities. This was followed by a priorities workshop in December of 1991, held in Washington, D.C., to refine and extend the recommendations of the Kansas City meeting. The results of this second meeting are the subject of this report.

This volume contains the overview and summary of the meeting and recommendations of the market area workshops.

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## **The Workshop**

The 1991 Transit Planning and Research Priorities Workshop began the job of outlining program needs for the \$283 million that can be expended under that program between now and 1997. The Workshop was attended by 146 representatives selected to ensure effective coverage of the many faceted transit and transit-related organizations that participate and benefit from the TP&R Program. The FTA sought their views through a structured two-day program of discussion and debate including specific recommendations for programs and projects.

FTA defined the objectives for the Workshop as follows:

- Identify high-priority programs for inclusion in the TP&R Program;
  - Clarify, refine, refocus, and perfect the scope, purpose and approach of the TP&R Program; and
  - Suggest several broad scenarios for the distribution of limited federal resources among competing programs.
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## **Target Markets**

The Workshop was organized around five target markets designed to reflect the industry's needs, the professional interests of the participants, and the markets served by the products and services of the TP&R Program. These target markets are:

1. Facilities and Equipment Engineering - ENGINEERING
2. Transportation Management - MANAGEMENT
3. Transportation Services - SERVICES
4. Financing - FINANCE
5. Major Investment - PLANNING

The deliberations and conclusions of the workshop were developed in concurrent breakout sessions organized around these five target markets. Each workshop session was led by an industry chairperson. The chairperson was given flexibility for organizing and guiding the session. Each group determined its own scoring and prioritizing processes for developing their recommendations. Due to

this flexibility there is some overlap in the area of recommendations, and the summaries vary in style and content.

Although important suggestions were generated from the market specific sessions, several strong and overriding recommendations were common to many or all sessions, including:

1. FTA must place much more emphasis on technical assistance in the collection and dissemination of research results, best practices, project results, reliable performance indicators, and other statistical data.
  2. Projects leading to reduced operating costs and enhanced revenues should take priority over all other candidates.
  3. Multi-modal system planning and transportation demand management are central to a program which promotes cost effective and balanced transportation solutions.
  4. Demand management and applications of new Advanced Public Transportation System (APTS) technologies and services should focus on assisting the transit industry's response to such major legislative mandates as Clean Air Act Amendments and the Americans with Disabilities Act (ADA).
  5. New transit technologies must be reintroduced into the mainstream of the TP&R Program in a reliable and timely manner.
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## **Workshop Results**

The activities, findings and conclusions of each target market session, as reported by the chairperson and by technical report developed at each session, are presented below with a short description of the market served.

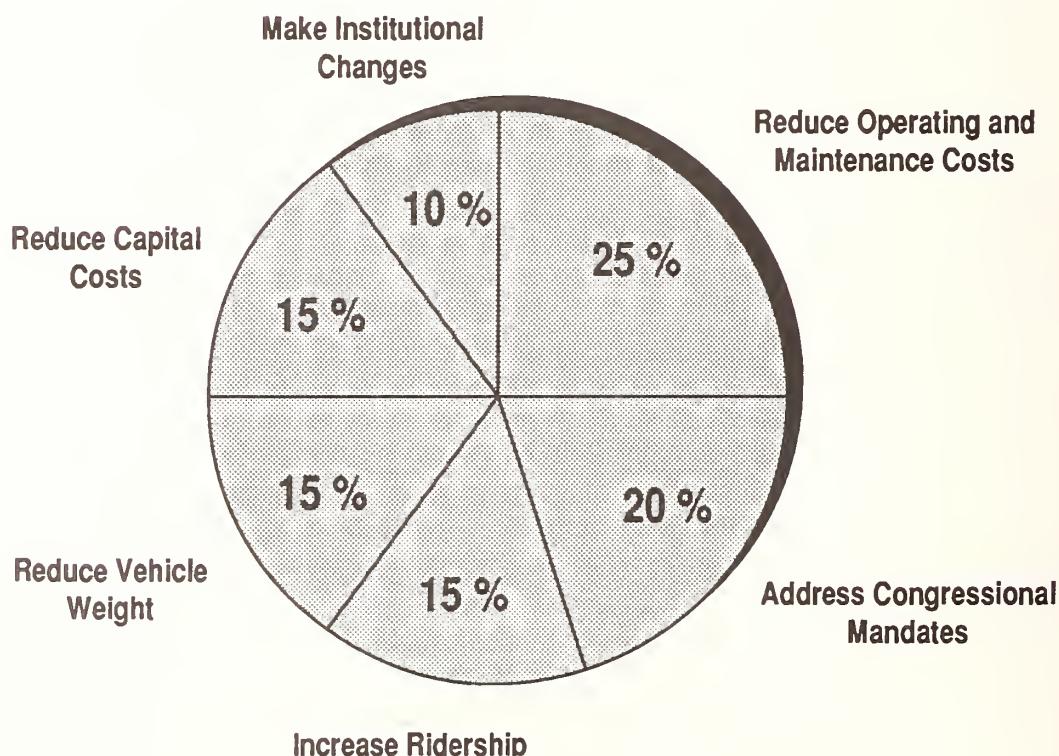
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## ENGINEERING

The activities included in this market segment involve: the final design, specification, construction, manufacture and acquisition of civil facilities; transportation systems; equipment and vehicles; project management; Quality Assurance/Quality Control (QA/QC); Value Engineering (VE); cost containment; testing; system safety; rehabilitation; modernization; and remanufacturing. Other important activities are rail construction, procurement training, system certification, product acceptance, competitive and negotiated procurement procedures, safety and other standards, specification writing, incentive contracting, and life-cycle costing.

The clients in this target market segment are the general managers, capital program managers, engineers, specifications writers, designers, procurement officials, and construction managers of the nation's transit systems and the consultants and suppliers that serve them.

The recommendations of this target market group were organized under six goal-oriented budget categories:



**FIGURE 1 . Engineering Budget Allocation**

As shown in Figure 1, operating and maintenance costs are the primary concern of this market segment.

This group started with 110 project ideas and ended with 21 priority projects. These projects covered a broad range of objectives and technologies, and are listed in rank order:

- ◆ Energy Utilization for Propulsion
- ◆ Passenger Convenience
- ◆ Intelligent Vehicle Utilization
- ◆ New Materials Evaluation
- ◆ Automated Surveillance
- ◆ Displays and Signage
- ◆ Size/Weight Optimization
- ◆ Lower Cost Fixed Guideways
- ◆ Life-Cycle Costing
- ◆ Emerging New Technologies
- ◆ Automated Operations and Maintenance
- ◆ New Fuels Storage & Cylinder Life
- ◆ Low Floor, Lightweight Buses
- ◆ Collision Avoidance and Crash Protection
- ◆ Traffic Control and Engineering
- ◆ Electric Vehicle Components
- ◆ Transportation Research Center
- ◆ Operating Characteristics Profile
- ◆ Access to Transit Systems
- ◆ Adaptive Train Control
- ◆ Overcoming Institutional Barriers

This group sought to employ engineering approaches to serve the management, services, and finance markets as well as the narrower market for facility and equipment engineering products.

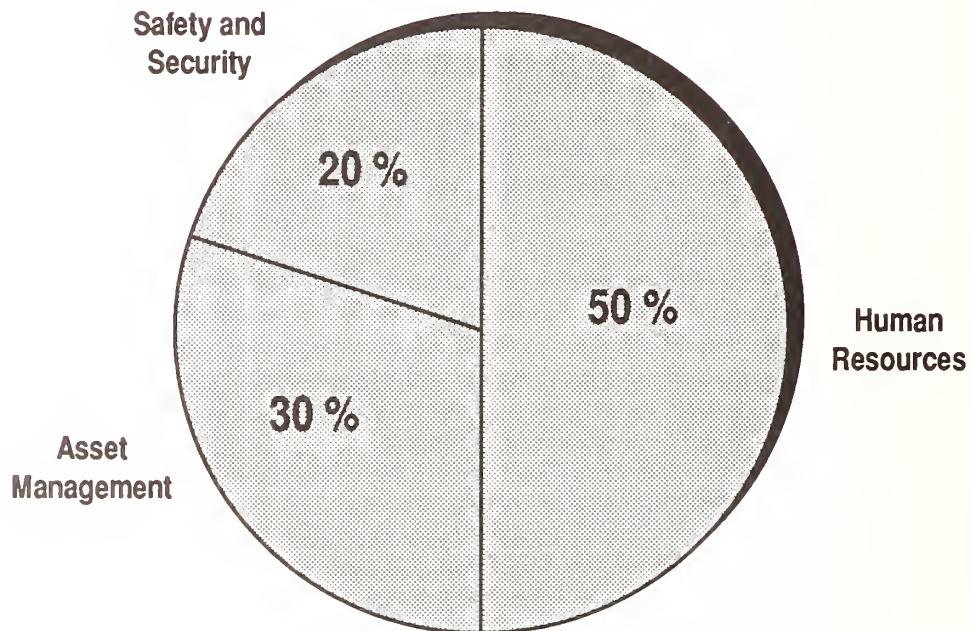
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## MANAGEMENT

This market includes general management, operations and maintenance management. TP&R products targeted at this market segment serve activities related to steady, day-to-day managerial functions of: financial planning; revenue processing and accounting; personnel administration including human resources and labor management; and drug, alcohol and employee assistance programs. Also included are activities related to operations and maintenance such as run cutting, road supervision, routine repair, preventative maintenance, and facility management.

The clients in this market segment include all policy and professional officials responsible for providing day-to-day safe, reliable, convenient, and affordable transit.

The priorities identified by this target market group are:



**FIGURE 2. Management Budget Allocation**

Within these three budget areas, specific topics that were recommended for study:

### Human Resources

- ◆ Work Force and Management Relations
- ◆ Cultural Diversity and Leadership Development
- ◆ Strategic Management Approach

### Asset Management

- ◆ Better Maintenance Management and Technical Skills
- ◆ Better Information Systems for Maintenance Management
- ◆ Incorporation of Primary Engineering Skills into Maintenance Management

### Safety and Security

- ◆ Personal Security Enhancements
- ◆ Improve Perception of Safety and Security

Human resource development and management dominated the discussion in this group. Human capital is transit's biggest expense, and also its biggest asset. Work force and management relations have been, and continue to be, transit's largest challenge. This traditional labor management relationship is further complicated by issues of diversity and changing needs of the work force. The group believed that the key to meeting transit challenges in the future was to forming a partnership with the work force, and using their ideas and energy to cut costs, increase service, and become more efficient.

Transit operators also need better maintenance management skills and better information systems to optimize their hardware resources and work force. Engineering skills should be developed in the maintenance area, for both supervisory and working level staff. This can

be accomplished through better education and training. In the third priority area, safety and security, the group determined that technically enhanced personal security and the public's perception of safety and security within the transit system must be improved. Indeed, some transit properties are the safest places in a given municipality, but are perceived to be among the most dangerous.

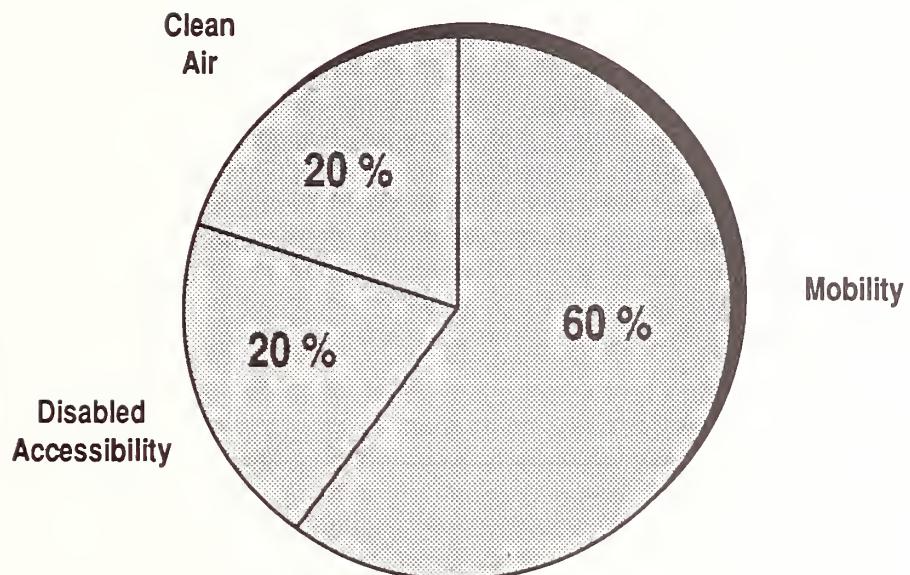
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## SERVICES

Activities in this market segment address the development and marketing of new bus and paratransit services, development of new and improved methods of relieving traffic congestion and provision of more responsive services using relatively low-cost, non-capital intensive strategies. These strategies include demand management and innovative services such as congestion pricing, parking management, paratransit, demand responsiveness, subscriptions, carpooling and vanpooling, and combinations of the above. Advanced Public Transportation Systems (APTS) is a means to aid in these improvements. Institutional and financial mechanisms such as employee vouchers are also of interest. Disabled access is a national mandate concerning this market segment.

The clients in this market segment include all officials and professionals charged with operating the transportation systems that utilize the roads and highways. The overriding priority for this market was to reduce costs and increase ridership.

For funding purposes, the session broke the market area into three broad categories:



**FIGURE 3. Services Budget Allocation**

Priorities were further broken down into approaches involving technology development and application, information, methods, planning, and education and training. Although the group saw limited need for new technology development to meet its objectives, it called for technology application and new methods and techniques to further the goals that it set for this market segment. Information and technology sharing were also important. The development of new services using advanced technologies such as APTS and planning techniques are emphasized over marketing and other institutional and financial innovations.

The service market area identified the following projects by grouping.

## Mobility - New Technological Development

- ◆ Quarter-Mile Moving Sidewalk

## Mobility - Information Sharing

- ◆ Single Trip Ride Sharing
- ◆ Intermodal Pre-trip Planning
- ◆ High Occupancy Vehicle Lane Enforcement
- ◆ Signal Priority
- ◆ Electronic Fare Collection
- ◆ Advanced Vehicle Control and Monitoring
- ◆ Alternative Communication Systems

## Mobility - Innovative Methods

- ◆ Human Factors ("Why?" Choices)
- ◆ Entrepreneurial Service Program
- ◆ Regional Management Coordination with FHWA
- ◆ Transportation Demand Management
- ◆ Service Configurations
- ◆ Pricing Policies
- ◆ Management Information Systems
- ◆ Application of Run Cutting and Scheduling
- ◆ Trip Elimination Strategies
- ◆ Clean Air New Technology Development
- ◆ System Approach to Engines and Fuels

## Clean Air Technology Applications

- ◆ Measurement of Vehicle Miles of Travel (VMT)
- ◆ Alternative Fuels and Propulsion
- ◆ Infrastructure Safety of Alternative Fuels
- ◆ Standardization of Test Methods

## Clean Air Innovative Methods

- ◆ Human Factors Considerations on Mode Splits
- ◆ Telecommuting
- ◆ Transportation Control Measures and Incentives

### **Transit Access and New Technology Development**

- ◆ Low Floor Buses
- ◆ Low Floor Light Rail Vehicle
- ◆ Tie Down Technology
- ◆ Fuzzy Logic Applications

### **Transit Access and Technological Applications**

- ◆ APTS Tracking and Dispatching
- ◆ Automated Third Party Billing
- ◆ Customer and Fleet Information Systems
- ◆ Coordination and Brokerage
- ◆ Disabled Information Access
- ◆ Paratransit Driver and Navigation Information

### **Transit Access Innovative Methodologies and Techniques**

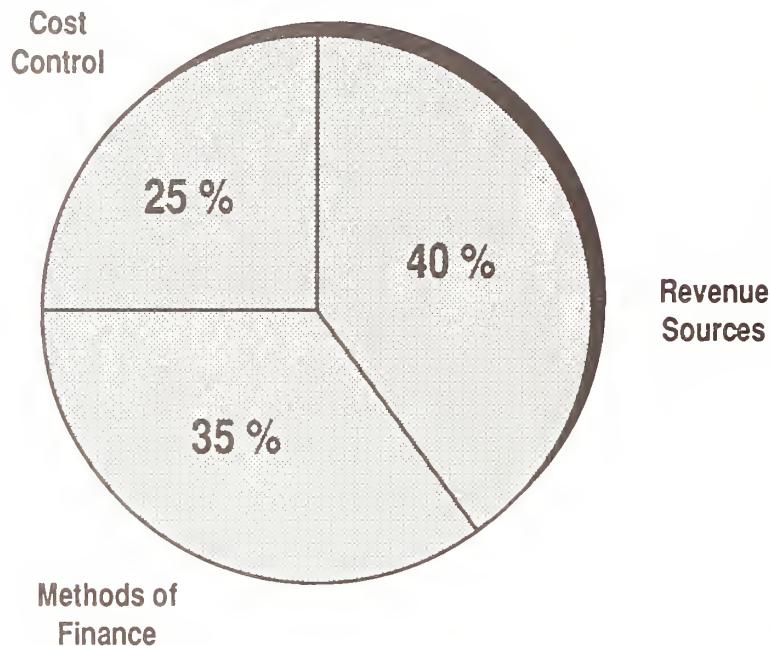
- ◆ Paratransit Dispatching
  - ◆ Intermodal Scheduling
  - ◆ Evaluation of Real-Time Scheduling
  - ◆ Demonstration and Evaluation of Service Routes
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## **FINANCE**

The activities associated with this market segment include all new and improved techniques and methods for financing the construction, acquisition and operation of transit, both private and public. Activities that deal with the concerns in this target market include financial planning, value capture, joint development, broad-based taxes, innovative financing, tax increment, bond financing, cross-border leasing, private equity, tolls, lease purchase agreements, other multi-source arrangements and cost reduction techniques involving shared construction and enhanced management systems.

The clients in this area include all Federal, state and local officials involved in funding transit.

Representatives of this market group identified three major topics for prioritizing their needs:



**FIGURE 4. Finance Budget Allocation**

Specific projects proposed for the finance area are grouped as follows.

#### Sources of Revenue

- ◆ Revenue Capture (Fareboxes)
- ◆ Cashless Ticket Pass System
- ◆ 1986 Tax Act Impact Study
- ◆ Grant Advance Funding
- ◆ Update "Rice" Study
- ◆ Congestion Pricing
- ◆ Joint Property Development

## Financing Methods

- ◆ Credit Enhancements
- ◆ Non-Profit Rolling Stock Leasing
- ◆ Model Financial and Procurement Systems

## Cost Controls

- ◆ Multi-Year Procurement of Buses
- ◆ Develop Cash Management Manual
- ◆ Design Competition and Proposal Costs
- ◆ Componentization (Sparing)
- ◆ Risk Management Techniques
- ◆ Information System Sharing within Industry
- ◆ Financial MIS Peer Group Review

A clear consensus was reached regarding the lack of a "level playing field" between the automotive and transit modes. At the same time, auto-restrictive requirements of clean air legislation, several state initiatives, and the ADA may alter the "cost" equation significantly. Congestion pricing, toll revenues and flexible Federal funding programs will provide greater opportunities in financing transit capital investments in the 1990s. Aided by new techniques for collection and improved marketing systems, farebox revenue may provide a greater share of the transit industry's funding base. Nevertheless, costs can and should continue to be a major concern. Emphasis was specifically placed on ways to control the cost of capital investments through improved costing data and risk management techniques. Specific recommendations include legislative and regulatory studies, new fare distribution and collection methods, toll collection technologies, new grant procedures, better ways to measure and manage risks, and documentation of effective innovations.

Also recognized was the need to increase the sharing of information within the industry and to streamline the grant process.

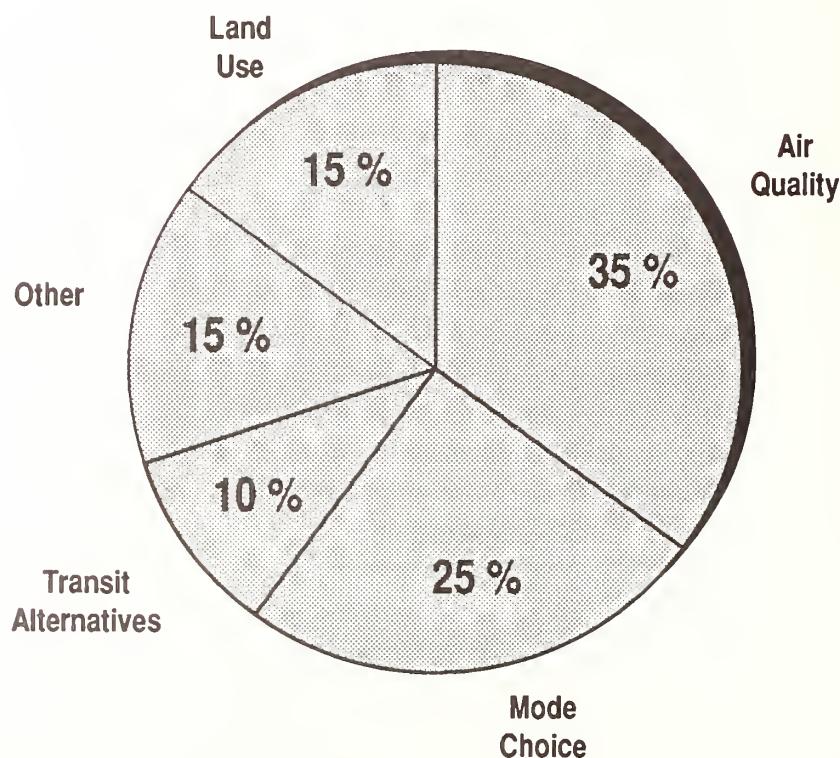
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## PLANNING

This target market session included planning and analysis activities leading to the implementation of capital investments for transit systems. Activities fell along a continuum starting with short-term, long-range systems planning, corridor planning, and ending in preliminary engineering. These activities address intermodal trade-offs, land use and air quality planning, alternatives analysis, demand forecasting, cost estimating and financial planning.

The clients for the TP&R products generated from this segment are the public officials with authority to approve and fund major capital projects and systems and the private sector suppliers of planning, engineering, system technologies, financing, and management support services.

The TP&R needs of the major transit investment planning market are numerous. The workshop participants identified 43 needed project activity areas, prioritizing these needs to 11 basic areas, and funding to \$21 million over 5 years. Budget categories were grouped as follows:



**FIGURE 5. Planning Budget Allocation**

The project areas identified are as follows:

- ◆ Mode Choice Analysis
- ◆ Transit Benefits Analysis
- ◆ Multi-Modal Mobility Measures
- ◆ Transit Sensitive Site Planning
- ◆ Quantify Social Costs of Transit
- ◆ Effect of Transfers
- ◆ Air Quality Impacts
- ◆ Suburban Transit Alternatives
- ◆ Improved Land Use Activities
- ◆ Land Use Effects of Transit Improvement
- ◆ Multi-Modal Planning Process

Mode choice, multi-mode travel, and mode shift tools and techniques ranked at the top of the list of planning improvements sought by major investors in transit systems. Since so many objectives of transit (accessibility, air quality, congestion relief, etc.) hinge on effecting mode shifts to transit, carpools and vanpools, the need for new data and tools is fundamental to the success of transit services. Top ranked in this market are studies on the effects of pricing, transfers, service quality, policy strategies, and macro-factors on mode choice. Theories, methods, and information sources are greatly needed for more accurate and reliable predictions of mode choice. Basic research is also needed to:

1. define and measure the full dimensions of multi-modal mobility;
2. weigh such factors as service quality, speed, frequency, and accessibility;
3. determine the cost to gauge how well our systems work and how well they are integrated; and
4. assure consistency across modes.

Multi-modal measures of economic, social, and environmental costs and benefits accepted by both highway and transit analysts are needed. Planning priorities for specific modal application included site planning principles that facilitate the ease and comfort of all modes and affect the physical nature of transfers and terminal design.

The recommendations of this target market group emphasize technical planning methodologies and data. They seek to better understand and predict the impact of modal investment choices on patrons.

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## ***FTA Program Response***

A critical aspect of the TP&R Priorities Workshop is the FTA response to the recommendations described above. To fully address the recommendations, FTA will be working with the ten program areas which currently define its TP&R Program:

1. Advanced Public Transportation Systems
2. Clean Air
3. Financing
4. Human Resources
5. Information
6. Regional Mobility
7. Safety and Security
8. Technology Development
9. Transit Accessibility
10. Project Development

Not all of these programs serve every market area and some of these serve more than one market area. Any individual project and activity area identified for action at the workshop can be associated with the above FTA program areas and considered within the context of those programs. Judgements of individual merit will be based on the identified need, with adjustments made for FTA policy considerations, Congressional instructions, and resources constraints. This process is both complex and ongoing.

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